

Construction on Practical Talents Training Mode in Environmental Monitoring Curriculum

Jing-Ping Wang Xin-Hong Wang

School of Chemistry and Environmental Engineering, Yancheng Teachers College ,Jiangsu, 224051, China

The research is supported by a Project Funded by the brand professional project form Yancheng teachers university (2016), the construction and practice of environmental monitoring curriculum system for environmental science applied talents training form Yancheng teachers university (16YCTCJY041), and A Project Funded by the Excellent Specialties Program Development of Jiangsu Higher Education Institutions (PPZY2015B113).

Abstract

Environmental Monitoring is a basic and comprehensive course for students majoring in environmental sciences and engineering. Based on the characteristics of this course, a new teaching mode in application of practical talents training in Environmental Monitoring Curriculum teaching mode is proposed including the new scheme of training applied talents, the new practical curriculums of developing innovative ability, the diversified practice platform for training talents, the extracurricular innovation experiment , the diversified social practice, the teaching reform project and results summary. It shows that the new teaching mode can effectively improve students' ability in comprehension, operation, experiment, innovation and practice. This is a beneficial exploration for achieving the target of cultivating students with professional skills and quality.

Key words: Environmental Monitoring; teaching mode; Practical Talents Training

1 Introduction

With the growing demand for high-quality talents in the field of applied environmental science in the 21st century, the most urgent and important topic which is placed in front of environmental science educators is how to improve the quality of talents. We continuously explore in talents' training mode, practice part setting and organize the implementation in the field of environmental science during the 11th Five-Year Plan. In order to train applied talents ,establish innovative experimental base and build diversified practice platform ,we design the new course system with emphasis on training innovative ability, optimize new ways and strategies of practice curriculum implementation, pay attention to the project-base of educational reform issue, actively explore and put research results into the practice of school running. At the same time, we strengthen the students' guidance of subject competition, expand the students' extracurricular innovation experiment and social practice, improve the students' comprehensive quality effectively, significantly improve students' competitiveness of advanced study and employment and achieve obvious managerial effectiveness.

2 Designing the new scheme of training applied talents

From 2008 to 2016, the department of environmental science organized research team which is lead by dean and the directors as the main members to go to Nanjing University, Nanjing Normal University, Nanjing Information Engineering University, Zhejiang university, Zhejiang university of technology and other universities for researching and studying of training talents plan especially the practical and experimental teaching reform. On the basis of extensive research and in-depth discussions, paying close attention to economic and social development and the needs of local industry development, definating the new direction of subject development and the new target of talents training, designing elective course modules of subject, training applied ability, increasing the proportion of practical teaching, strengthening the combining of professional practice with social practice. We revise talents' training plan of environmental science subject repeatedly for highlighting application and enhancing adaptability.

3 Establishing the new practical curriculums of developing innovative ability

With the new target of talents training of applied environmental science, we establish new practical curriculums of developing innovative ability. (1) experiment courses separated from theory courses; (2) the experiment projects by in-class points type into the curriculum integration layer and the integration of content and innovation; for example, <environmental monitoring experiment>,<environmental chemistry experiment>, <environmental engineering experiment> as the basis of the experimental course system, <the comprehensive experiment of environmental science>, <environmental science professional skills training> as the extension of comprehensive experiment, strengthening the cultivation of the students' innovative ability and the diversity of experiment. (3) with progressive arrangement: "practice of cognition" → "practice of curriculums" → " practice of profession " → " practice of graduation ", by cooperation between colleges and companies ,going from classes into the society, strengthening penetration of applied element and training of innovative ability.

4 Building the diversified practice platform for training talents

The principles of building environmental monitoring curriculum system are improving the students' practical ability, creative ability, employment ability and entrepreneurial ability. At the same time, factory practice and professional practice are the important periods. The stable practice base is the important condition of practice teaching. For building stable practice platform, we establish cooperated relations with Yancheng Jianbang Water Affairs Co., Ltd., Jianhu Eastern Sewage Treatment Plant, Yancheng Eastern Sewage Treatment Plant, Yancheng Environmental Monitoring Center Station, Tinghu Environmental Monitoring Station, Dongtai Environmental Monitoring Station and so on. We put the knowledge and ability training for professional jobs into professional teaching system with mutual penetration of the humanities social and technical education, establishing professional course system of work-integrated learning. The establishment of the bases builds better environment for students' practice and provides important guarantee of academic disciplines and quality of teachers for training talents.

5 Optimizing the new ways and new strategies of practical curriculums

With the opportunity of undergraduate teaching level evaluation by the ministry of education in 2007, and revising version of the talent training scheme in 2009, 2012, 2015, we take a hard look at the way and strategy of practice teaching reform. Through the specific implementation of the teaching management standardization and teaching reform research, optimizing the new ways and new strategies of practical curriculums: (1) revised the practice curriculum outline and the new ways of assessment; (2) combined centralized experiments in class with extracurricular comprehensive experiments and innovative experiments which are dispersed and flexible; (3) combined the outline specified experiment with practical innovation projects and researches; (4) combined the open laboratory with the networked experimental teaching management; (5) combined high quality teaching with efficient practice; (6) combined standardized experiment report with small experimental papers which are diversified; (7) combined specified examination of in-class experiment with random detection of professional skills; (8) combined short-term evaluation with long-term development. Through the new ways and new strategies, practice teaching presents specified, flexible and diversified views. It greatly advanced the pace of training applied talents.

6 Expanding the extracurricular innovation experiment and the diversified social practice

Establishing innovative experiment projects, practice training programs and characteristic technology teams by arranging for students to participate in the teachers' scientific researches earlier and inspiring the passion and enthusiasm of students' scientific research innovation. Since 2008, students in the department of environmental science have declared 9 provincial practice innovation training projects of college students, and have published 17 papers as the first author. Not only that, some technology associations ,such as "Source of Green" environmental protection association and science and technology association, actively involved in the construction of ecological city new community as the representative for the college students' social practice activities with their professional knowledge and skills. Some social practice , such as "Exclaim of Green-protecting our water" and "Keeping Yancheng clean for welcoming the World Expo", are full of variety. Through these, students can broaden their vision outside the classroom and enhance application in practice.

7 Strengthening the teaching reform project and results summary

Around the new training system of applied talents, approving project and researching provincial key subject, such as "the development and application of experimental teaching management system under network environment". "Building the researches and practice of new experiment teaching system which focuses on ability training" .School-level construction project of innovation course, "scientific innovation experiment" as an example .We also have environmental monitoring, environmental chemistry and other three excellent courses. As well as the environmental quality assessment and other six key courses that we set up. In addition, there are four online course construction projects such as environmental engineering. Coagulating the group strength through projects in order to start teaching research and teaching construction effectively and push the implementation of the new talents training system steadily. At the same time, we pay attention to the refining and summary of the educational reform results. We contributed and participated in nearly 20 environmental science teaching conference held in Shanghai, Xinxiang, Suzhou, Tianjin, Wuhan, Taiyuan and other places. We published 15 papers, such as "permeated education of the environmental protection consciousness in chemistry teaching", "diversified teaching pattern research and practice of environmental chemistry", "applied talents training mode study of environmental science ".The students of our college students won the gold medal of "Challenge Cup" National Undergraduate Business Plan Competition five times between 2012 and 2016.In 2015, we also achieved 1 special prize, 1 first prize, 4 second prize, 4 third prize in "general analysis cup" yancheng universities environmental monitoring skills contest and achieved 1 special prize, 1 first prize, 2 second prize, 5 third prize in the next year. Meanwhile, our students achieved 1 special prize, 1 first prize and 1 second prize in

"Alalis Cup" water treatment competition of Jiangsu Province ordinary college students in 2016. In addition, we pay attention to demonstration effect of practice teaching. And in order to ensure the coordinated development of environment and economy, we train applied talents for environmental protection industry by holding continuing education of NTU coastal environmental protection training and personnel training of lianyungang chemical industry zone enterprise wastewater treatment plants with environmental technology and engineering institute of Nanjing university.

8 Improving students' comprehensive quality and employment competitiveness

The construction and practice of applied talents who are in the field of applied environmental science promote students' practical ability and innovative spirit. The students deeply love their major and actively participate in the technological innovation experiment. They obtain college funding 5 times, obtain undergraduate provincial practical innovation training project subsidization 9 times as well. On the other hand, our students actively participate in various subject researches, openly publish 17 papers and obtain more than 10 provincial awards. The acceptance rate of graduate admission examination of our major students One's deceased father grind students enthusiasm high, environmental science professional one's is over 36%, and 53.8% universities are belong to 985, 211. Students have strong comprehensive competence, the employment rate is nearly 100%, the students of our major are well received by the internship units and employers.

In brief, practical teaching is an indispensable part for training talents of environmental science, the main purposes of it is to improve the ability for learning and solving problems, inspire innovative thinking, explore knowledge, and train high-quality environmental protection talents for economic development.

References

- [1] Qian Liping, Xu Shengyou, Ma Minghai. (2013). Teaching Mode Reform of Environmental Monitoring for Application-Oriented Talent Training. *Journal of Huangshan University*, 15(3):132-135.
- [2] Chen Jianjun, Li bo, Zhan fangdong. (2017). A reform in teaching system for a practice oriented course of environmental monitoring. *Journal of Yunnan Agricultural University (Social Science)* , 11(2):88-91,109.
- [3] Yang Qi, HU Hui, Zhang Ying, Nlu Xiaoqing, Chen Jichun. (2016). Application of PBL and TBL Integrated Teaching Model in Course of Environment Engineering Major. *Reseach and exploration in laboratory*, 35(6):204-207.
- [4] Luo Ping. (2014). Construction and Research on the Course of Environmental Monitoring teaching approach in colleges and universities. *Journal of higher chemical education*, 11(5):59-60,97.
- [5] Ge Xiaoyan, Yang Shuanghua. (2013). Discussion and Practice on Teaching Model of Environmental Monitoring Experiment Curriculum. *Journal of Luoyang Institute of Science and Technology(Natural Science Edition)*, 23(4):94-96.
- [6] Ye Xinggang. (2016). Research on the teaching mode of Environmental monitoring and management technology specialty in higher vocational education Based on modern apprentice system—taking the operation of water treatment system as an example. *Journal of Hunan industry polytechnic*, 16(4):71-74.